

## DNA: The Genetic Material Chapter 12



Oct 30-9:07 PM

### Review:

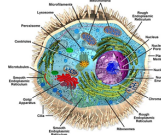
All living things must have genetic material  
Species must be able to pass on that genetic material to future generations



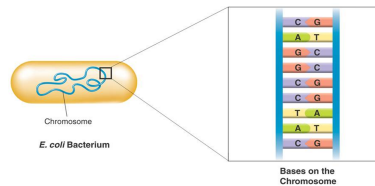
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# DNA is short for Deoxyribonucleic acid

- It is located in the nucleus of cells in eukaryotes.



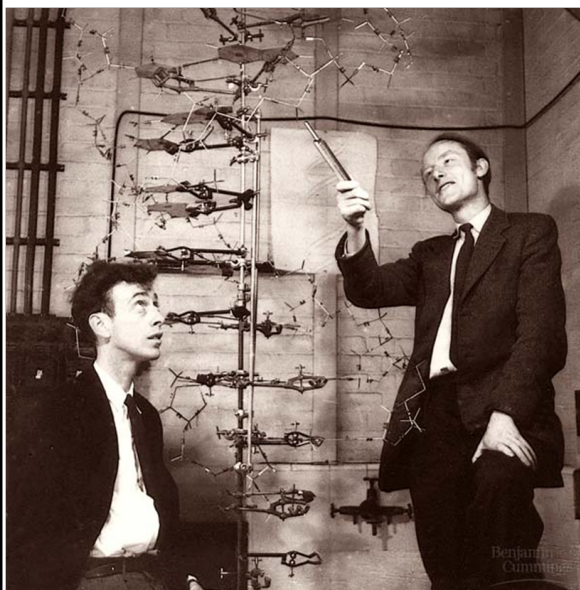
- Found in the cytoplasm of prokaryotes



- It is the master plan that makes you who you are.

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## DNA is a Double Helix

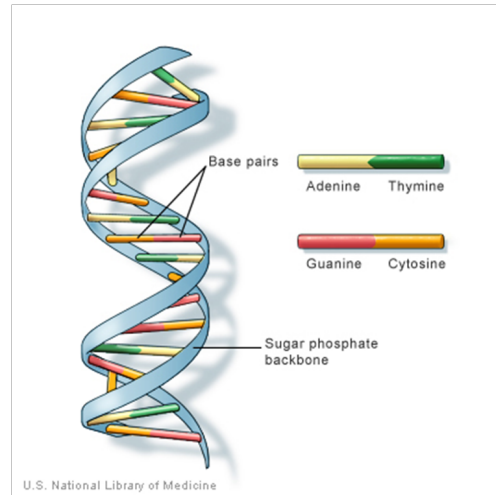
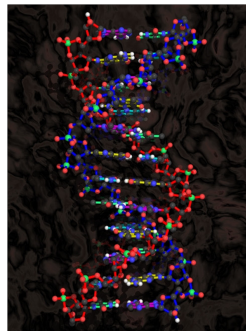
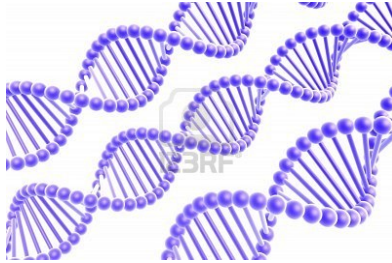


- 1953: Watson and Crick
- Using the base pairing rule and X-ray photos from 1950 made a 3-D model using tin and wire
- The result was the double helix, a “spiral staircase” configuration

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# The Structure of DNA

The double helix is like a twisted ladder.



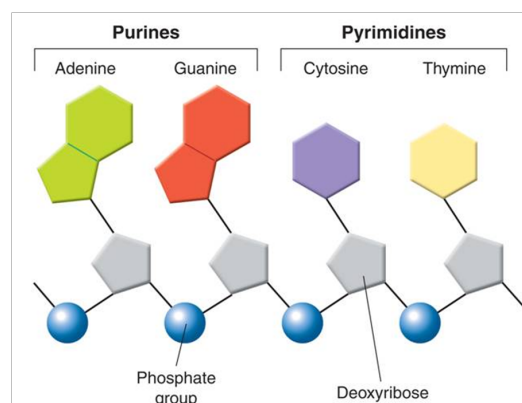
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## Building Blocks of DNA

Nucleotides: subunits (monomers) that make up DNA

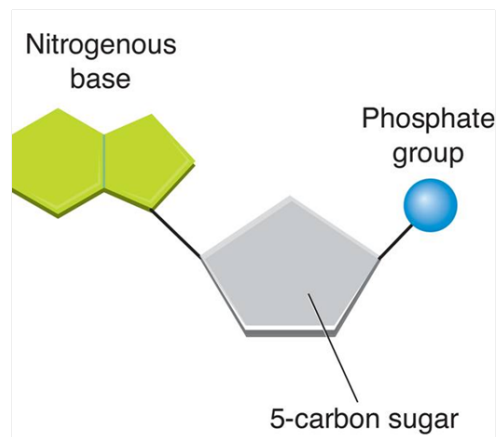
Each nucleotide is constructed of three parts:

- A phosphate group
- A five-carbon sugar molecule
- A nitrogen base



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# Building Blocks of DNA



The Backbone of the DNA molecule is made of:

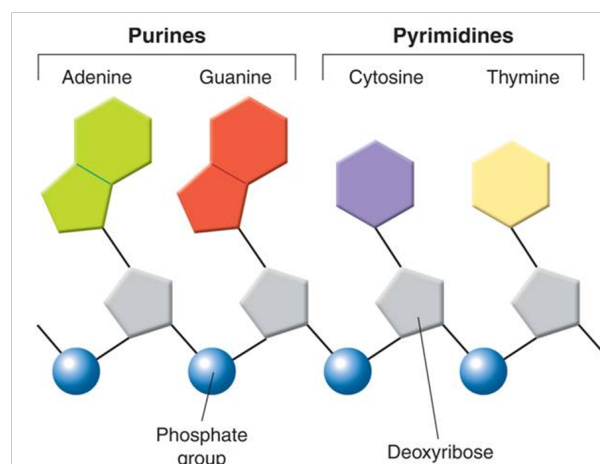
- Five-carbon sugar molecule: deoxyribose
- Phosphate group

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# Building Blocks of DNA

Nucleotides- four different types:

- Adenine (A)
- Guanine (G)
- Thymine (T)
- Cytosine (C)

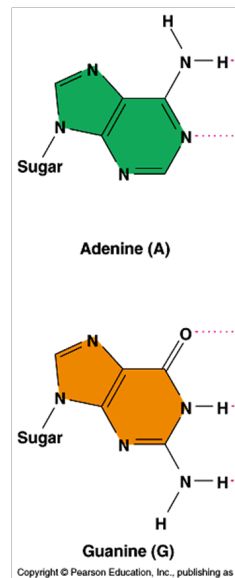


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# Building Blocks of DNA

Purines: a class of organic molecules that have a double ring of carbon and nitrogen atoms

- Adenine (A)
- Guanine (G)

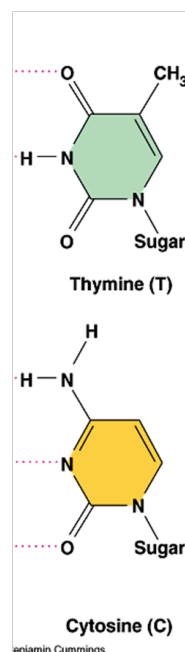


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# Building Blocks of DNA

Pyrimidines: a class of organic molecules that have a single ring of carbon and nitrogen

- Thymine (T)
- Cytosine (C)

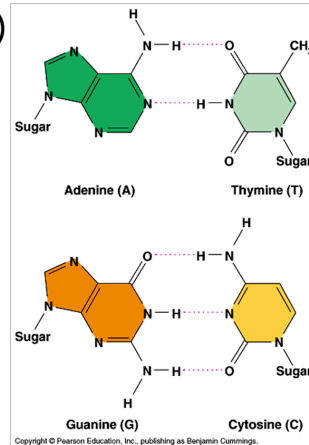


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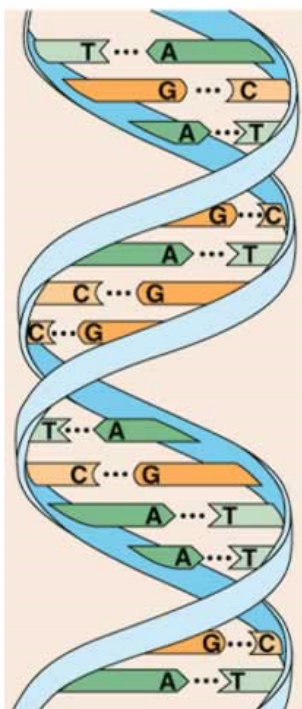
# Chargarff's Rules

Base pairing rules: A-T and C-G

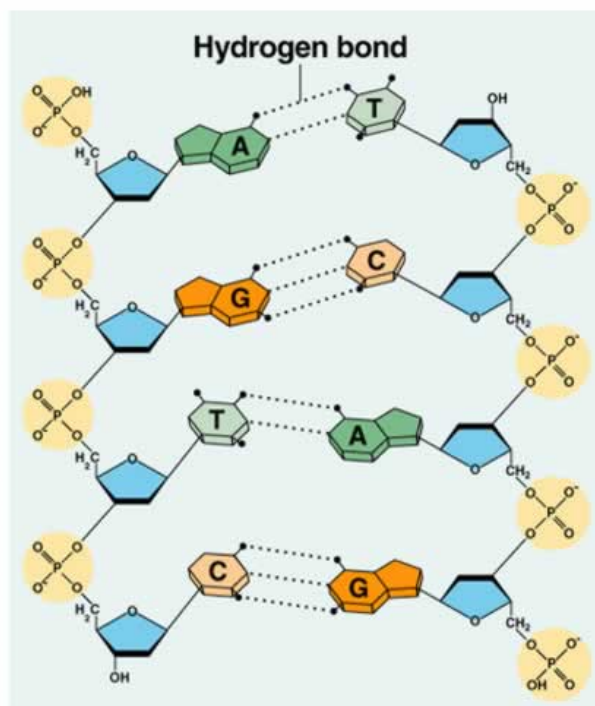
- The amount of guanine always equals the amount of cytosine  
(number of G = number of C)
- The amount of adenine always equals the amount of thymine  
(number of A = number of T)



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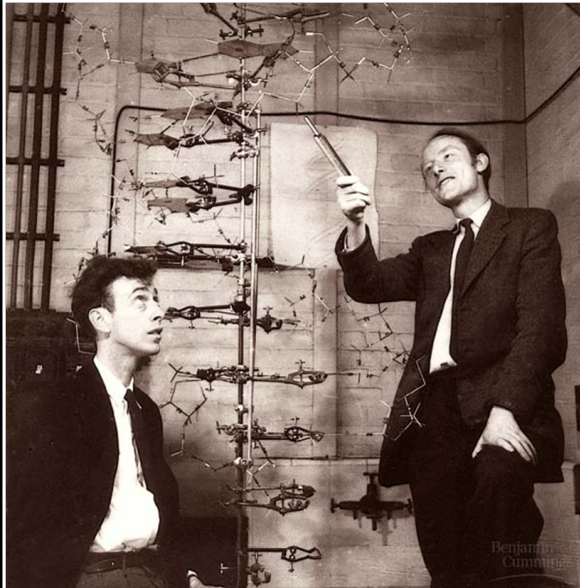
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Nov 3-8:15 PM



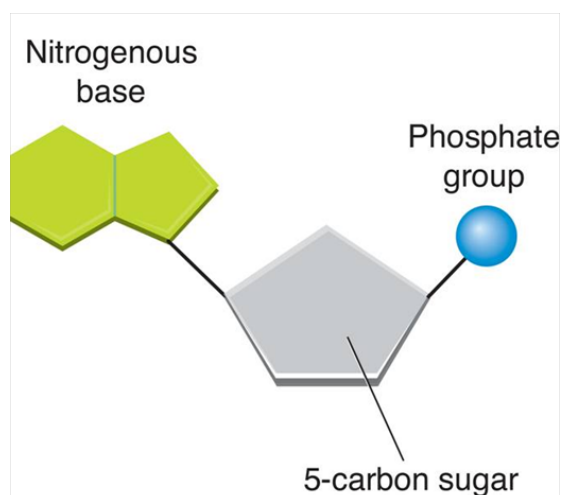
# DNA is a Double Helix



- 1953: Watson and Crick
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## Draw the Nucleotide



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# Let's practice base pairing

Write the complementary strand for the following sequence

AGTCCTGAAATCGG

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